US010620595B2

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(12) **United States Patent**
Slupik et al.

(10) **Patent No.:** US 10,620,595 B2
(45) **Date of Patent:** Apr. 14, 2020

(54) **SYSTEM, METHOD AND APPARATUS FOR RESUPPLYING CONSUMABLES ASSOCIATED WITH APPLIANCES**

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(*) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 117 days.

(21) Appl. No.: **15/807,619**

(22) Filed: **Nov. 9, 2017**

(65) **Prior Publication Data**

US 2018/0074468 A1   Mar. 15, 2018

Related U.S. Application Data

(63) Continuation of application No. 14/513,847, filed on Oct. 14, 2014, now Pat. No. 9,864,351.
(Continued)

(51) **Int. Cl.**
H04L 12/28   (2006.01)
G05B 15/02   (2006.01)
(Continued)

(52) **U.S. Cl.**
CPC **G05B 15/02** (2013.01); **G06Q 30/0633** (2013.01); **H04L 12/2803** (2013.01);
(Continued)

(58) **Field of Classification Search**
CPC H04L 12/2816; H04L 12/2825; H04L 12/2827; H04L 12/2803; G05B 15/02
See application file for complete search history.

(56) **References Cited**

U.S. PATENT DOCUMENTS

5,305,199 A   4/1994 LoBiondo et al.
6,107,918 A   8/2000 Klein et al.
(Continued)

FOREIGN PATENT DOCUMENTS

WO   0073966 A1   12/2000
WO   03075243 A1   9/2003

OTHER PUBLICATIONS

Related U.S. Appl. No. 14/513,847, Non-Final Office Action, dated May 16, 2017.
(Continued)

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(57)   **ABSTRACT**

A consumable-goods reordering system in which a system controller has access to the signals transmitted by each smart appliance relevant to the environment being monitored, such as a home. Each appliance monitors a particular physical condition that is related to the appliance's usage of a consumable good, senses changes in the condition being monitored, and reports states of the condition. Meanwhile, the system controller memorizes and maintains the states of various processing events, such as when an appliance reported a particular state of the monitored condition. By considering the information reported by the multiple smart appliances, as well as by accounting for the states corresponding to the various events, the system controller is able to continually update a representation of the state of the monitored environment. Having such context awareness enables the system controller to generate intelligently various reorder messages for transmission to the various suppliers of the consumables.

12 Claims, 8 Drawing Sheets

From Operation 501

503

Generate a representation of the state of environment 400, based on i) one or more signal values received and/or ii) one or more memorized states of at least one processing event and/or iii) other information providing context — 701

Infer one or more activities at environment 400, based on i) one or more signal values received and/or ii) one or more memorized states of at least one processing event and/or iii) other information providing context — 703

Anticipate one or more events affecting environment 400, based on i) one or more signal values received and/or ii) one or more memorized states of at least one processing event and/or iii) other information providing context — 705

Generate one or more reorder indications, based on the results generated in one or more of operations 701, 703, and 705 — 707

Determine one or more delivery parameters including delivery schedule, based on i) the reorder indication(s) and ii) the results generated in one or more of operations 701, 703, and 705 — 709

Select one or more supplier systems, based i) the reorder indication(s), ii) the delivery parameters, and iii) supplier-dependent parameters — 711

Generate one or more messages to the one or more supplier systems selected, based i) the reorder indication(s), ii) the delivery parameters, and iii) the selected supplier systems — 713

To Operation 505